UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Northwest Region
7600 Sand Point Way N.E., Bldg. 1
Seattle, WA 98115

Refer to:
2002/01059

October 7, 2003

Mr. Lawrence C. Evans
Portland District
Corps of Engineers
CENWP-OP-GP (Ms. Kathryn Harris)
P.O. Box 2946
Portland, OR 97208-2946

Re: Endangered Species Act Section 7 Formal Consultation and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation on the Removal of Contaminated Sediment from the former Hoy's Marine Site, Yaquina River Basin, Lincoln County, Oregon (Corps No. 200200643)

Dear Mr. Evans:

Enclosed is a biological opinion (Opinion) prepared by NOAA's National Marine Fisheries Service (NOAA Fisheries) pursuant to section 7 of the Endangered Species Act (ESA) on the issuance of permits under the section 404 of the Clean Water Act and section 10 of the Rivers and Harbors Act for the removal of contaminated sediment from the site of the former Hoy's Marine Site, Yaquina River basin, Lincoln County, Oregon. NOAA Fisheries concludes in this Opinion that the proposed action is not likely to jeopardize Oregon Coast coho salmon (*Oncorhynchus kisutch*). As required by section 7 of the ESA, NOAA Fisheries included reasonable and prudent measures with non-discretionary terms and conditions that NOAA Fisheries believes are necessary to avoid or minimize the effects of incidental take associated with this action.

This document also serves as consultation on essential fish habitat pursuant to section 305(b) of the Magnuson-Stevens Fishery Conservation and Management Act and its implementing regulations (50 CFR 600).

Please direct any questions regarding this letter to Robert Anderson of my staff in the Oregon Habitat Branch at 503.231.2226.

Sincerely,

for Michael R Course

D. Robert Lohn
Regional Administrator

Endangered Species Act - Section 7 Consultation
Biological Opinion

&

Magnuson-Stevens Fishery Conservation and Management Act
Essential Fish Habitat Consultation

Removal of Contaminated Sediment from the former Hoy's Marine Site
Yaquina River Basin
Lincoln County, Oregon

Agency:	U.S. Army Corps of Engineers
Consultation Conducted By:	NOAA's National Marine Fisheries Service, Northwest Region
Date Issued:	October 7, 2003
Issued by:	for Michael R Crouse D. Robert Lohn Regional Administrator
Refer to:	**2002/01059**

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1. INTRODUCTION

The Endangered Species Act (ESA) of 1973 (16 USC 1531-1544), as amended, establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat on which they depend. Section 7(a)(2) of the ESA requires Federal agencies to consult with U.S. Fish and Wildlife Service and NOAA's National Marine Fisheries Service (NOAA Fisheries), as appropriate, to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or adversely modify or destroy their designated critical habitats. This biological opinion (Opinion) is the product of an interagency consultation pursuant to section 7(a)(2) of the ESA and implementing regulations found at 50 CFR 402.

The analysis also fulfills the essential fish habitat (EFH) requirements under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). The MSA, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance EFH for those species regulated under a Federal fisheries management plan. Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2)).

The proposed action is issuance of permits to the Oregon Department of Environmental Quality (ODEQ) by the U.S. Army Corps of Engineers (Corps) under section 404 of the Clean Water Act and under section 10 of the Rivers and Harbors Act for removal of contaminated sediment from the former Hoy's Marine Site in the Yaquina River. The administrative record for this consultation is on file at the Oregon Habitat Branch office of NOAA Fisheries. Specific elements of the proposed action are described below.

1.1 Background and Consultation History

On August 29, 2002, NOAA Fisheries received a letter from the Corps requesting consultation pursuant to section 7(a)(2) of the ESA and EFH consultation pursuant to section 305(b)(2) of the MSA on the issuance of permits to the Oregon Department of Environmental Quality (ODEQ) by the Corps under section 404 of the Clean Water Act and under section 10 of the Rivers and Harbors Act for removal of contaminated sediment from the site of the former Hoy's Marine Site on the Yaquina River. Submitted with the letter was a draft biological assessment (BA) describing the proposed action and potential effects that may result from project implementation. In the draft BA, the Corps determined that the proposed action was likely to adversely affect OC coho salmon, an ESA-listed species, and requested formal consultation. OC coho salmon were

listed as threatened under the ESA on August 10, 1998 (63 FR 42587), and protective regulations were issued on July 10, 2000 (65 FR 42422). NOAA Fisheries responded with a letter of nonconcurrence to the Corps on October 28, 2002, that said the consultation could not be completed until additional information was provided. On May 7, 2003, NOAA Fisheries received the requested information.

1.2 Proposed Action

The proposed action is issuance of permits to the Oregon Department of Environmental Quality (ODEQ) by the U.S. Army Corps of Engineers (Corps) under section 404 of the Clean Water Act and under section 10 of the Rivers and Harbors Act for removal of contaminated sediment from the Yaquina River at river mile 4.6. Specific elements of the proposed project are described below.

1.2.1 Dredging

The ODEQ proposes to dredge three removal areas using a mechanical environmental clamshell bucket. The estimated depth of dredging would range between 3 feet (ft) and 4 ft below mudline (Table 1).

An estimated additional 450 cubic yards may be generated due to sloughing of the riverbed on the perimeter of the dredged areas.

Table 1. Dredge Areas, Depths, and Volumes.

	Area 1	**Area 2**	**Area 3**
Area (square ft)	9000	10725	16780
Depth (ft)	3	4	3
Volume (cubic yards)	1000	1600	1950

1.2.2 Transportation

Dredged materials would be placed onto a flatbed scow or barge equipped with sideboards and scuppers around the perimeter of the deck line to promote draining of excess water to the scuppers. The scuppers would be lined with haybales to filter runoff before discharge of return water to the Yaquina River. Dredged materials on the vessel would be managed to prevent discharge of dredged materials into the Yaquina River. The surface deck of the vessel would be lined with a non-woven polypropylene geotextile fabric with an apparent opening size no greater than 180 microns that is suitable for retaining sediment while allowing water to drain from the

vessel. Dredged materials would be removed from the vessel by crane excavator and placed into trucks lined with a non-woven polypropylene geotextile fabric at the Newport International Terminal for transport to the ODEQ upland disposal site. The non-woven polypropylene geotextile fabric would be removed and replaced after each unloading of sediment.

1.2.3 Disposal Site

ODEQ proposes to construct an upland disposal site approximately 500 ft landward from the Yaquina River near river mile 2.3. The upland site would measure 115 ft by 255 ft with 10-foot thick walls. The disposal cell would be lined with a non-woven polypropylene geotextile fabric. The disposal cell would lie 1.5 ft above the high groundwater table, and be covered with 1.5 ft of soil.

1.2.4 Marine Railway and Dry Dock Removal

An inoperable marine railway and dry dock that currently lies in dredge area 2 would be removed during low tide before dredging.

1.2.5 Bathymetric Surveys

As part of the project proposal, a licensed surveyor would conduct pre-dredge, progress, and post-dredge bathymetric surveys.

1.2.6 Conservation Measures

NOAA Fisheries regards the conservation measures included in the consultation request as useful and important to minimize adverse effects to OC coho salmon and their habitats, and considers them to be an integral part of the proposed action. Conservation measures in the following categories would apply (see BA for details): (1) Use of a mechanical environmental clamshell bucket for dredging; (2) dredge machinery operations, equipment decontamination, water quality monitoring, sediment and erosion control plan; (3) pollution control plan, and (4) refueling and petrochemical plan.

1.3 Description of the Action Area

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area (project area) involved in the proposed action (50 CFR 402.02). For this consultation, the action area includes all marine and riverine habitats accessible to OC coho salmon in the Yaquina River from river mile 2.2 to river mile 5.0, including the upland disposal site.

2. ENDANGERED SPECIES ACT

2.1 Biological Opinion

This Opinion considers the potential effects of the proposed action on OC coho salmon, which occur in the action area.

2.1.1 Biological Information

Spawning, incubation, rearing, and migration occur throughout accessible reaches of the Yaquina watershed (Table 2).

Table 2. OC Coho Salmon Life History Timing in the Yaquina River Basin (Weitkamp 1995, Steelquist 1992, Oregon Department of Fish and Wildlife, [ODFW] 2003). Light Shading Represents Low-Level Abundance, Dark Shading Represents Peak Abundance

	J	F	M	A	M	J	J	A	S	O	N	D
River Entry												
Spawning												
Incubation-Intragravel Development												
Juvenile Freshwater Rearing												
Juvenile Migration												
Juvenile Residence in Estuary												

Estimated escapement of coho salmon in coastal Oregon was about 1.4 million fish in the early 1900s, with harvest of nearly 400,000 fish (Weitkamp *et al.* 1995). Abundance of wild OC coho salmon declined during the period from about 1965 to 1975 (Nickelson *et al.* 1992). Lichatowich (1989) concluded that production potential (based on stock recruit models) for OC coho salmon in coastal Oregon rivers was only about 800,000 fish, and associated this decline with a reduction in habitat capacity of nearly 50%. Wild spawner abundance in this evolutionarily significant unit (ESU) has ranged from 16, 510 adults in 1990 to 59,453 adults in 1996, to nearly 239,000 adult coho in 2002 (ODFW 2003).

Estimated spawning populations for naturally-produced coho salmon in the Yaquina River basin averaged 3805 adults from 1990 through 2002 (Table 3).

Survey data collected by ODFW in the Yaquina River basin estimated densities of juvenile OC coho salmon ranging from 0.02 fish m^{-2} to 0.41 fish m^{-2} (Rodgers 2001).

Table 3. Estimated Spawning Populations for Naturally-Produced Coho Salmon in the Yaquina River Basin (Jacobs *et al.* 2001, ODFW 2002)

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
	381	380	633	549	2448	5668	5127	384	365	2588	647	3039	27253

2.1.2 Evaluating Proposed Actions

The standards for determining jeopardy are set forth in section 7(a)(2) of the ESA as defined by 50 CFR 402.02 (the consultation regulations). In conducting analyses of habitat-altering actions under section 7 of the ESA, NOAA Fisheries uses the following steps of the consultation regulations and when appropriate combines them with the Habitat Approach (NOAA Fisheries 1999): (1) Consider the biological requirements of the listed species; (2) evaluate the relevance of the environmental baseline in the action area to the species' current status; (3) determine the effects of the proposed or continuing action on the species; and (4) determine whether the species can be expected to survive with an adequate potential for recovery under the effects of the proposed or continuing action, the effects of the environmental baseline, and any cumulative effects, and considering measures for survival and recovery specific to other life stages. In completing this step of the analysis, NOAA Fisheries determines whether the action under consultation, together with cumulative effects when added to the environmental baseline, is likely to jeopardize the ESA-listed species. If so, step 5 occurs. In step 5, NOAA Fisheries may identify reasonable and prudent alternatives for the action that avoid jeopardy, if any exist.

The fourth step above requires a two-part analysis. The first part focuses on the action area and defines the proposed action's effects in terms of the species' biological requirements in that area (*i.e.*, effects on essential habitat features). The second part focuses on the species itself. It describes the action's effects on individual fish, or populations, or both, and places these effects in the context of the evolutionarily significant unit (ESU) as a whole. Ultimately, the analysis seeks to answer the question of whether the proposed action is likely to jeopardize a listed species' continued existence.

2.1.3 Biological Requirements

The first step in the methods NOAA Fisheries uses for applying the ESA section 7(a)(2) to listed salmon is to define the species' biological requirements that are most relevant to each consultation. NOAA Fisheries also considers the current status of the listed species taking into account population size, trends, distribution and genetic diversity. To assess the status

of the listed species, NOAA Fisheries starts with the determinations made in its decision to list the species for ESA protection and also considers new data available that is relevant to the determination.

The biological requirements are population characteristics necessary for OC coho salmon to survive and recover to naturally-reproducing population levels, at which time protection under the ESA would become unnecessary. Adequate population levels must safeguard the genetic diversity of the listed stock, enhance its capacity to adapt to various environmental conditions, and allow it to become self-sustaining in the natural environment.

For actions that affect freshwater habitat, NOAA Fisheries usually describes the habitat portion of a species' biological requirements in terms of a concept called properly functioning condition (PFC). PFC is defined as the sustained presence of natural, habitat-forming processes in a watershed that are necessary for the long-term survival of the species through the full range of environmental variation (NOAA Fisheries 1999). PFC, then, constitutes the habitat component of a species' biological requirements. OC coho salmon survival in the wild depends upon the proper functioning of ecosystem processes, including habitat formation and maintenance. Restoring functional habitats depends largely on allowing natural processes to increase their ecological function, while at the same time removing adverse effects of current practices. For this consultation, the biological requirements are improved habitat characteristics that would function to support successful adult migration and juvenile rearing, upstream and downstream migration, and smoltification.

Essential habitat features for juvenile rearing (growth and development) areas include adequate water quality, water quantity, water velocity, cover and shelter, dietary and spatial resources, riparian vegetation, and safe passage to upstream and downstream habitats. Essential habitat features for juvenile migration corridors include adequate water quality, water quantity, water velocity, cover and shelter, dietary resources, riparian vegetation and space. Essential habitat features for adult migration corridors include adequate water quality, water quantity, water velocity, cover and shelter, riparian vegetation and space.

2.1.4 Environmental Baseline

In step two of NOAA Fisheries' analysis, it evaluates the relevance of the environmental baseline in the action area. Regulations implementing section 7 of the ESA (50 CFR 402.02) define the environmental baseline as the past and present effects of all Federal, state, or private actions and other human activities in the action area. The environmental baseline also includes the anticipated effects of all proposed Federal projects in the action area that have undergone section 7 consultation, and the effects of state and private actions that are contemporaneous with the consultation in progress.

Land uses in the action area include rural-residential, commercial-industrial, agricultural, recreation, and commercial forestry. Riparian areas and stream channels in the action area have been damaged by activities related to these land uses throughout the watershed (FEMAT 1993,

Botkin *et al.* 1995, OCSRI 1997). Habitat changes that have contributed to the decline of OC coho in the action area include: (1) Reduced biological, chemical, and physical connectivity between streams, riparian areas, flood plains, and uplands; (2) elevated fine sediment yields; (3) reduced in-stream large woody debris; (4) loss or degradation of riparian vegetation; (5) altered stream channel morphology; (6) altered base and peak stream flows; and (7) fish passage impediments. Estuarine habitats in the Yaquina River basin have been significantly degraded and reduced in size due to land use practices and development. An estimated 202.1 acres of intertidal habitat have been lost, 257 acres of tidal marsh have been filled, and 1240 acres of tidal marsh have been diked (Seliskar and Gallagher 1983, Boule and Bierly 1987). This is a significant loss of habitat for rearing and smoltification of OC coho salmon in the Yaquina River basin. NOAA Fisheries (1995) identified habitat degradation as a factor for decline in listing OC coho salmon as a threatened species under the ESA.

NOAA Fisheries concludes that not all of the biological requirements of the listed species within the action area are being met under present conditions. Based on the best available information on the status of OC coho salmon, including population status, trends, and genetics, and the environmental baseline conditions within the action area, significant improvement in habitat conditions is needed to meet the biological requirements of OC coho salmon for survival and recovery.

2.1.5 Analysis of Effects

In step three of NOAA Fisheries' jeopardy analysis, it evaluates the effects of proposed actions on listed species and seeks to answer the question of whether the species can be expected to survive with an adequate potential for recovery if those actions go forward.

2.1.5.1 Effects of the Proposed Action

Physical Habitat Alteration

The potential effects of dredging on physical habitat features include modification of bottom topography with resultant changes in water circulation patterns, changes to nearshore habitat structure, and a shift to coarser substrate within the dredged area. The significance of the effects is a function of the ratio of the size of the dredged area to the size of the bottom area and water volume (Morton 1977). Dredging may convert intertidal habitats to subtidal, or shallow subtidal habitats to deeper subtidal. Such conversions may affect plant and animal assemblages uniquely adapted to the particular site conditions these habitats offer.

The proposed dredging would occur in shallow-water, nearshore habitat. No seagrass or eelgrass was observed during a field investigation conducted by the consulting firm Hart Crowser (see BA). According to the Oregon *Estuary Plan Book* (Oregon Department of Land Conservation and Development 1987), seagrass assemblages occur immediately upstream of the proposed dredging areas. Bathymetric surveys were not conducted so depth ranges were estimated. Estimated depth ranges based on sampling depth intervals are -2.7 to -19.5 feet. The proposed dredging would increase the maximum depth in the project area to -23.5 feet. Sediment grain

size in the dredge areas is comprised of gravel, ranging from a low of 0.1% to a high of 7.3%; sand, ranging from a low of 28% to a high of 87.4%; silt, ranging from a low of 4.7% to a high of 47.6%; and clay, ranging from a low of 3.8% to a high of 24.1%. The loss of vegetated shallow-water, nearshore habitat would represent a reduction of rearing capacity as well as potential disruption and reduction in landscape connectivity (Nightingale and Simenstad 2001).

NOAA Fisheries expects the proposed dredging of 0.84 acres within the lower Yaquina River to affect bottom topography and water circulation patterns in the project area, and within an unknown area upstream and downstream of the dredging areas based on the angle of repose and substrate type, but to be unlikely to cause large-scale or long-term effects such as loss of seagrass or conversion of nearshore intertidal habitat to subtidal habitat.

Fish Harassment

Dredging is likely to temporarily displace rearing juvenile OC coho salmon from the dredge areas and nearshore habitats upstream and downstream of dredging operations due to increases in acoustic energy and turbidity. The proposed dredging timing, November 1 through February 15, is likely to minimize adverse effects to juvenile OC coho salmon, since abundance of juvenile salmon is likely to be low. Adult OC coho salmon are likely to be migrating through the area during dredging, but likely would use deeper, mid-channel areas of the river for migration, therefore minimizing the potential for adverse effects.

Contaminated Sediments

Analytical results for sediment testing submitted by the ODEQ included data on sediment composition, metals, and total organic carbon (Table 4). The tests identified elevated concentrations of copper, zinc, nickle, arsenic, chromium, at concentrations that can cause sublethal effects to juvenile salmonid fishes, including, but not limited to, gill dysfunction, causing inhibition of gill Na^+ K^+ ATPase activity, reduced growth, altered hematology, respiratory stress, and diminished responsiveness in juvenile salmonid fishes (Sorensen 1991).

Table 4. Sediment Test Results at the Former Hoy's Marine site on the Yaquina River.

Compound	Sublethal Effects Level (parts per billion) (Buchman 1999)	Sediment Test Concentrations (low)	Sediment Test Concentrations (high)
Copper	34,000	110,000	978,000
Zinc	150,000	39,300	1,890,000
Nickel	20,900	11,200	102,000
Arsenic	8,200	8,100	38,900
Chromium	81,000	19,500	293,000
Lead	46,700	6,730	156,000

Pore-water concentrations of tributyltin in the project area ranged from a low of 0.017 µg/L to a high of 0.020 µg/L.

Since sediment characterization was determined using general compositing methods, and did not include an analysis to determine the vertical or horizontal extent of contaminants, it is not possible to determine the amount or distribution of contaminants that would remain following completion of dredging. Removal of contaminated sediments from this area of the Yaquina River is likely to reduce the total contaminant load and result in localized ecological benefits, but cells of contaminants would remain just outside the proposed dredge areas (*e.g.*, at stations IT-IT-03, ST15SD, IT-ST-07, ST14SD, ST12SD, and IT-ST-08). In the absence of definitive information, NOAA Fisheries makes the biologically conservative assumption that OC coho salmon are likely to continue to be exposed to contaminants at concentrations likely to cause sublethal effects.

Water Quality - Total Suspended Solids and Turbidity

Potential effects from project-related increases in turbidity on OC coho salmon include, but are not limited to: (1) Reduction in feeding rates and growth, (2) increased mortality, (3) physiological stress, (4) behavioral avoidance, (5) reduction in macroinvertebrate populations, and (6) temporary beneficial effects. Potential beneficial effects include a reduction in piscivorous fish/bird predation rates, enhanced cover conditions, and improved survival conditions.

Turbidity is defined as a measurement of relative clarity due to an increase in dissolved or suspended, undissolved particles. At moderate levels, turbidity can reduce primary and secondary productivity and, at high levels, has the potential to interfere with feeding and to injure and kill adult and juvenile fish (Spence *et al.* 1996, Bjornn and Reiser 1991). Other behavioral effects on fish, such as gill flaring and feeding changes, have been observed in response to pulses of suspended sediment (Berg and Northcote 1985). Fine, redeposited sediments can also reduce primary and secondary productivity (Spence *et al.* 1996), and reduce incubation success and interstitial rearing space for juvenile salmonids (Bjornn and Reiser 1991). Salmonid fishes have been observed to move laterally and downstream to avoid turbid plumes (Sigler *et al.* 1984, Lloyd 1987, Servizi and Martens 1991). Juvenile salmonid fishes tend to avoid streams that are chronically turbid, such as glacial streams or those disturbed by human activities, except when the fish must traverse these streams along migration routes (Lloyd *et al.* 1987). In addition, a potential positive effect is providing refuge and cover from predation. Fish that remain in turbid waters experience a reduction in predation from piscivorous fish and birds (Gregory and Levings 1998). In habitats with intense predation pressure, this provides a beneficial trade-off of enhanced survival in exchange for physical effects such as reduced growth.

Exposure duration is a critical determinant of the occurrence and magnitude of physical or behavioral effects (Newcombe and MacDonald 1991). Salmonid fishes have evolved in waters that periodically experience short-term pulses (days to weeks) of high suspended sediment loads, often associated with floods, and are adapted to such high pulse exposures. Adult and larger

juvenile salmonid fishes appear to be little affected by the high concentrations of suspended sediments that occur during storm and snowmelt runoff episodes (Bjornn and Reiser 1991). However, chronic exposure can cause physiological stress that can increase maintenance energy and reduce feeding and growth (Redding *et al.* 1987, Lloyd 1987, Servizi and Martens 1991).

Increases in TSS can adversely affect filter-feeding macroinvertebrates and fish feeding. At concentrations of 53 to 92 ppm (24 hours) macroinvertebrate populations were reduced (Gammon 1970). Concentrations of 250 ppm (1 hour) caused a 95% reduction in feeding rates in juvenile coho salmon (Noggle 1978). Concentrations of 1200 ppm (96 hours) killed juvenile coho salmon (Noggle 1978). Concentrations of 53.5 ppm (12 hours) caused physiological stress and changes in behavior in coho salmon (Berg 1983).

The proposed dredging is likely to increase turbidity upstream (due to incoming tides) and downstream of the work area for sustained periods. These increases in turbidity are likely to increase physiological stress and displace rearing juveniles. Salmon are likely to avoid waters that are chronically turbid, and therefore adverse effects are less likely after initial exposure; however, repeated pulses of turbidity that persist over a period of days or weeks may displace rearing salmon for longer periods, possibly reducing survival. Dredging during the proposed in-water work window, November 1 through February 15, is likely to minimize the above effects on 0+ age juvenile salmon in the action area as abundance with this age class is likely low during this time of year. However, 0+ age juvenile salmon present in the action area exposed to chronically turbid waters are likely to be injured or killed. One+ age juvenile salmon are more likely to be present in the action area in low to moderate abundance. While more adapted to turbid waters, 1+ age juvenile salmon likely would be exposed to increases in turbidity during this time of year when background turbidity is high, and likely would experience increased physiological stress and potentially physical injury (*e.g.*, gill abrasion).

Water Quality – Dissolved Oxygen

Dredging fine sediments would likely create a sediment plume that may not disperse rapidly, especially during incoming tides. This could decrease dissolved oxygen in the water column due to higher biological oxygen demand (BOD) in the re-suspended sediments. During dredging in Grays Harbor, Smith *et al.* (1976) measured dissolved oxygen at 2.9 mg/l, and LaSalle (1990) found a decrease in dissolved oxygen to 16-83% in the mid-to-upper water column from nearly 100% close to the bottom. Decreases in dissolved oxygen have been shown to adversely affect swimming performance in salmonid fishes (Bjornn and Reiser 1991). Reductions in dissolved oxygen due to the proposed dredging could delay or slow immigration of adult coho salmon into the Yaquina River and displace rearing juvenile salmon if effects of dredging affect water column dissolved oxygen as described above. NOAA Fisheries expects only minor effects on oxygen concentrations due to the limited area being dredged, upland disposal of dredged materials, and to the seasonal restriction that will limit dredging to the time of year that BOD is likely to be low.

Effects to Benthic Prey Resources

Dredging physically disturbs channel bottoms, eliminating or displacing established benthic invertebrate communities, and reducing prey availability to coho salmon. Dredging may also suppress the ability of some benthic species to re-colonize the dredged area, thus creating a loss of benthic diversity and food sources for the prey species of coho salmon. This may increase OC coho salmon intraspecific aggression, displace them from preferred rearing habitat, and reduce production of juveniles to the smolt stage. NOAA Fisheries expects the proposed removal of surface contaminants will improve substrate quality and promote re-colonization of benthic invertebrates, minimizing the effects described above.

Dredging Equipment

Operation of heavy equipment requires the use of fuel, lubricants, coolants, and other petroleum products, which if spilled into a water body could injure or kill aquatic organisms. Petroleum-based contaminants, such as fuel, oil, and some hydraulic fluids, contain harmful polycyclic aromatic hydrocarbons. The proposed action includes a pollution control plan, however, the Corps provided no details of the plan and therefore its potential effectiveness cannot be evaluated.

Disposal Site

ODEQ proposes to construct an upland disposal site approximately 500 ft landward from the Yaquina River near river mile 2.3. The upland site would measure 115 ft by 255 ft. with 10-foot thick walls. The disposal cell would be lined with a non-woven polypropylene geotextile fabric with an apparent opening size no greater than 180 microns that is suitable for retaining sediment while allowing water to drain. The disposal cell would lie 1.5 ft above the high groundwater table and have a 1.5-foot deep cover of soil. Due to the distance of the proposed disposal site from the Yaquina River, NOAA Fisheries does not expect any effects from construction of the disposal site. Effects of contaminants that may chemically disassociate from the sediments and leach from the disposal cell into the groundwater, potentially migrating into the Yaquina River, are largely unknown. The Corps provided no information about management of leachate, so NOAA Fisheries cannot evaluate the risk of groundwater becoming contaminated and migrating into the Yaquina River.

Effects of Removing the Marine Railway and Dry Dock

An existing marine railway and dry dock would be removed before dredging. The railway consists of two steel rails that extend into the Yaquina River approximately 100 ft. The dry dock, at low tide, is above the wetted perimeter of the Yaquina River. The dry dock measures approximately 50 ft by 70 ft. Effects of removing the marine railway are likely to be similar to those described above under *Water Quality - Total Suspended Solids and Turbidity*. NOAA Fisheries expects effects on nearshore habitat from removing the dry dock to be discountable, although there is some uncertainty due to the limited details provided about removal of the structure.

2.1.5.2 Cumulative Effects

Cumulative effects are defined in 50 CFR 402.02 as "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation."

NOAA Fisheries is not aware of any specific future non-federal activities within the action area that would cause greater effects to listed species than presently occurs. The action area includes significant tracts of private and state lands. Land use on these non-federal lands include rural development, agricultural, and commercial forestry. Chemical fertilizers or pesticides are used on many of these lands, but no specific information is available regarding their use. Furthermore, NOAA Fisheries generally does not consider the rules governing timber harvests, agricultural practices, and rural development on non-federal lands within Oregon to be sufficiently protective of watershed, riparian, and stream habitat functions to support the survival and recovery of listed species. Therefore, these habitat functions likely are at risk due to future activities on non-federal forest lands within the basin.

Non-federal activities within the action area are expected to increase due to a projected 34% increase in human population by the year 2024 in Oregon (Oregon Department of Administrative Services 1999). Thus, NOAA Fisheries assumes that future private and state actions will continue within the action area, increasing as population density rises.

2.1.6 Conclusion

The fourth step in NOAA Fisheries' approach to determine jeopardy is to determine whether the proposed action, in light of the above factors, is likely to appreciably reduce the likelihood of the species' survival and recovery in the wild. For the jeopardy determination, NOAA Fisheries uses the consultation regulations, and its Habitat Approach (NOAA Fisheries 1999) to determine whether actions would further degrade the environmental baseline or hinder attainment of PFC at a spatial scale relevant to the listed ESU. That is, because the OC coho salmon ESU consists of groups of populations that inhabit geographic areas ranging in size from less than ten to several thousand square miles, the analysis must be applied at a spatial resolution wherein the actual effects of the action upon the species can be determined.

After reviewing the best available scientific and commercial information available regarding the current status of the OC coho salmon ESU, the environmental baseline for the action area, the effects of the proposed action, and cumulative effects, NOAA Fisheries concludes that the action, as proposed, is not likely to jeopardize the continued existence of OC coho salmon.

Our conclusion is based on the following considerations: (1) All in-water work will occur at a time of year when abundance of juvenile OC coho salmon is low; (2) use of a mechanical environmental clamshell bucket will minimize entrainment of OC coho salmon and migration of contaminated sediments dredged from the project area, and minimize turbidity; (3) any reductions of dissolved oxygen will be short-lived; and (4) the effects of this action are not likely

to impair currently properly functioning habitats, appreciably reduce the functioning of already impaired habitats, or retard the long-term progress of impaired habitats toward proper functioning condition essential to the long-term survival and recovery at the population or ESU scale.

2.1.7 Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Conservation recommendations are discretionary measures suggested to minimize or avoid adverse effects of a proposed action on listed species, to minimize or avoid adverse modification of critical habitats, or to develop additional information. The following conservation recommendations are consistent with these obligations, and therefore should be carried out by the Corps:

1. The Corps, in cooperation with the ODEQ, should condition the CWA section 404 permit to include stations IT-IT-03, ST15SD, IT-ST-07, ST14SD, ST12SD, and IT-ST-08 as noted in the February 4, 2002, letter sent to the ODEQ by NOAA's National Ocean Service, Coastal Protection and Restoration Division. Inclusion of these stations would result in removal of additional sediments contaminated with concentrations of metals likely to cause sublethal adverse effects to OC coho salmon.

2. The Corps should programmatically reassess the potential effects of contaminants from dredged materials, including sublethal effects on listed fish and bioaccumulation in fish and benthic invertebrate prey species.

3. As recommended by NOAA Fisheries' Northwest Fisheries Science Center, the Corps should determine sediment and tissue concentrations rather than pore-water concentrations when assessing contamination levels.

In order for NOAA Fisheries to be kept informed of actions minimizing adverse effects, or those that benefit listed salmon and their habitats, NOAA Fisheries requests notification of any actions leading to the achievement of these conservation recommendations.

2.1.9 Reinitiation of Consultation

As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) The amount or extent of taking specified in the incidental take statement is exceeded, or is expected to be exceeded; (2) new information (*e.g.*, monitoring, modeling) reveals effects of the action may affect listed species in a way not previously considered; (3) the action is modified in a way that causes an effect on listed species that was not previously considered; or (4) a new species is listed or critical habitat is designated that may be

affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending conclusion of the reinitiated consultation.

2.2 Incidental Take Statement

The ESA at section 9 [16 USC 1538] prohibits take of endangered species. The prohibition of take is extended to threatened anadromous salmonids by section 4(d) rule [50 CFR 223.203]. Take is defined by the statute as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct." [16 USC 1532(19)] Harm is defined by regulation as "an act which actually kills or injures fish or wildlife. Such an act may include significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavior patterns, including, breeding, spawning, rearing, migrating, feeding or sheltering." [50 CFR 222.102] Harass is defined as "an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering." [50 CFR 17.3] Incidental take is defined as "takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant." [50 CFR 402.02] The ESA at section 7(o)(2) removes the prohibition from any incidental taking that is in compliance with the terms and conditions specified in a section 7(b)(4) incidental take statement [16 USC 1536].

2.2.1 Amount or Extent of Take

The proposed action covered by this Opinion is reasonably certain to result in incidental take of listed species due to changes in physical habitat, fish harassment, resuspension and distribution of contaminated sediments, temporary changes in water quality, and reduction in benthic prey resources. Effects of actions such as these are largely unquantifiable in the short term, but are likely to be largely limited to harm in the form of injury and behavior modification. Therefore, even though NOAA Fisheries expects some low level of incidental take to occur due to the action covered by this Opinion, the best scientific and commercial data available are not sufficient to enable it to estimate a specific amount of incidental take. In instances such as this, NOAA Fisheries designates the expected level of take in terms of the extent of take allowed. Therefore, the extent of take for this opinion is limited to take resulting from activities undertaken as described in this Opinion that occurs in the action area, which includes all marine and riverine habitats accessible to OC coho salmon in the Yaquina River from river mile 2.2 to river mile 5.0, and the upland disposal site. Incidental take occurring due to modifications to the proposed action or beyond the area described is not authorized by this consultation.

2.2.2 Reasonable and Prudent Measures

Reasonable and prudent measures are non-discretionary measures to minimize take, that may or may not already be part of the description of the proposed action. They must be implemented as binding conditions for the exemption in section 7(a)(2) to apply. The Corps has the continuing duty to regulate the activities covered in this incidental take statement. If the Corps fails to

require the applicants to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, or fails to retain the oversight to ensure compliance with these terms and conditions, the protective coverage of section 7(o)(2) may lapse.

The following reasonable and prudent measures are necessary and appropriate to minimize take of listed fish resulting from implementation of the proposed action. The Corps shall ensure that:

1. The amount and extent of incidental take from the proposed action are minimized by ensuring that the proposed conservation measures are fully implemented.

2. The likelihood of incidental take associated with dredging are minimized by applying permit conditions to avoid or minimize disturbance to OC coho salmon and aquatic habitats.

3. The reasonable and prudent measures, conservation measures and dredging are monitored and evaluated.

2.2.3. Terms and Conditions

These measures should be incorporated into construction contracts and subcontracts to ensure that the work is carried out in the manner prescribed.

1. To implement reasonable and prudent measure #1 (conservation measures), the Corps shall ensure that conservation measures proposed as part of the proposed action (BA, at pp. 23-25) are fully implemented.

2. To implement reasonable and prudent measure #2 (dredging), the Corps shall ensure that:

    a. The angle of repose is no steeper than 5H:1V to prevent sloughing, erosion, and exposure and resuspension of contaminated sediments in outlying areas (e.g., stations IT-IT-03, ST15SD, IT-ST-07, ST14SD, ST12SD, and IT-ST-08). The only area exempt from this requirement is the 110-foot long area immediately in front of the working dock where an angle of repose of 2H:1V was proposed to maintain slope stability and integrity of the piling foundations.
    b. All dredging is completed within the in-water work period of November 1 through 15 February. Any adjustments to the in-water work period must be approved in writing by NOAA Fisheries.
    c. To minimize turbidity effects and upstream movement of contaminants, dredging shall only occur during out going tides.
    d. Following removal of contaminated sediments, the applicant complete sediment testing to establish contaminant concentrations of the exposed surface.
        i. A minimum of five samples per dredge area shall be taken.
        ii. Samples shall remain distinct and not composited.

iii. Sample depth shall be at least 1.5 feet below surface.
iv. At a minimum, sediment samples shall be tested for copper, zinc, nickel, arsenic, chromium, lead, and tributyltin concentrations.

e. The applicant shall provide to the Corps and NOAA Fisheries within120 days of completion of dredging:
   i. A copy of the sediment test results.
   ii. An outline for an analysis of effects of any remaining contaminants on ESA-listed salmonid fishes and their habitat.

3. To implement reasonable and prudent measure #3 (monitoring), the Corps shall ensure that the applicant monitor and record:

a. The implementation of conservation measures, including the success or failure of conservation measures, actions taken to correct any problems, and confirmation that the proposed project elements were carried-out as proposed.
b. The specific methods used to minimize generation of sediment and turbidity, and effectiveness of those measures.
c. The extent, duration, and frequency of any turbidity plumes related to project activities.
d. The volume of dredged material.
e. The results of pre-dredge, progress, and post-dredge bathymetric surveys.
f. Any observed injury and/or mortality of fish resulting from project implementation.
   i. NOTICE. If a sick, injured or dead specimen of a threatened or endangered species is found, the finder must notify the Vancouver Field Office of NOAA Fisheries Law Enforcement at 360.418.4246. The finder must take care in handling of sick or injured specimens to ensure effective treatment, and in handling dead specimens to preserve biological material in the best possible condition for later analysis of cause of death. The finder also has the responsibility to carry out instructions provided by Law Enforcement to ensure that evidence intrinsic to the specimen is not disturbed unnecessarily.
g. Monitoring reports shall be submitted within 120 analysis of completion of dredging to:

National Marine Fisheries Service
Oregon Habitat Branch, Habitat Conservation Division
Attn: 2002/01059
525 NE Oregon Street, Suite 500
Portland, OR 97232-2778

3. MAGNUSON-STEVENS ACT

3.1 Background

Pursuant to the MSA:

- NOAA Fisheries must provide conservation recommendations for any Federal or state action that would adversely affect EFH (§305(b)(4)(A)).

- Federal agencies must provide a detailed response in writing to NOAA Fisheries within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting the impact of the activity on EFH. In the case of a response that is inconsistent with NOAA Fisheries EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations (§305(b)(4)(B)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (MSA §3). For the purpose of interpreting this definition of EFH: "Waters" include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; "substrate" includes sediment, hard bottom, structures underlying the waters, and associated biological communities; "necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.10). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

EFH consultation with NOAA Fisheries is required regarding any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and upslope activities.

The objectives of this EFH consultation are to determine whether the proposed action would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects on EFH.

3.2 Identification of EFH

Pursuant to the MSA the Pacific Fisheries Management Council (PFMC) has designated EFH for three species of federally-managed Pacific salmon: Chinook (*O. tshawytscha*); coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California,

except areas upstream of certain impassable man-made barriers (as identified by the PFMC 1999), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years). EFH also has been designated for groundfish species and coastal pelagic species. The estuarine EFH composite includes those waters, substrates and associated biological communities within bays and estuaries of the exclusive economic zone (EEZ), from mean higher high water level (MHHW) or extent of upriver saltwater intrusion to the respective outer boundaries for each bay or estuary as defined in 33 CFR 80.1 (Coast Guard lines of demarcation). Detailed descriptions and identifications of EFH are contained in the fishery management plans for groundfish (PFMC 1999), coastal pelagic species (PFMC 1999a), and Pacific salmon (PFMC 1999b). Casillas *et al.* (1998) provides additional detail on the groundfish EFH habitat complexes.

3.3 Proposed Action

The proposed action is detailed above in section 1.2 of this document. For this consultation, the action area includes all marine and riverine habitats accessible to OC coho salmon in the Yaquina River from river mile 2.2 to river mile 5.0, and the upland disposal site. This area has been designated as EFH for various life stages of coastal pelagic species, ground fish species, and chinook and coho salmon (Table 4).

3.4 Effects of Proposed Action

The proposed action will adversely affect water and sediment quality for coastal pelagic species, groundfish species, and chinook and coho salmon.

3.5 Conclusion

The proposed action will adversely affect the EFH for coastal pelagic species, groundfish species, and chinook and coho salmon in the action area.

3.6 EFH Conservation Recommendations

Pursuant to section 305(b)(4)(A) of the MSA, NOAA Fisheries is required to provide EFH conservation recommendations for any Federal or state agency action that would adversely affect EFH. NOAA Fisheries recommends the Corps implement the conservation recommendations and terms and conditions in the ESA consultation.

3.7 Statutory Response Requirement

Please note that the MSA (section 305(b)) and 50 CFR 600.920G) requires the Federal agency to provide a written response to NOAA Fisheries after receiving EFH conservation recommendations within 30 days of its receipt of this letter. This response must include a description of measures proposed by the agency to avoid, minimize, mitigate, or offset the adverse effects of the activity on EFH. If the response is inconsistent with a conservation

recommendation from NOAA Fisheries, the agency must explain its reasons for not following the recommendation.

3.8 Supplemental Consultation

The Corps must reinitiate EFH consultation with NOAA Fisheries if either action is substantially revised or new information becomes available that affects the basis for NOAA Fisheries' EFH conservation recommendations (50 CFR 600.920).

Table 5. Species with designated EFH in the estuarine EFH composite in the State of Oregon.

Groundfish Species	
Leopard Shark (southern OR only)	*Triakis semifasciata*
Soupfin Shark	*Galeorhinus zyopterus*
Spiny Dogfish	*Squalus acanthias*
California Skate	*Raja inornata*
Spotted Ratfish	*Hydrolagus colliei*
Lingcod	*Ophiodon elongatus*
Cabezon	*Scorpaenichthys marmoratus*
Kelp Greenling	*Hexagrammos decagrammus*
Pacific Cod	*Gadus macrocephalus*
Pacific Whiting (Hake)	*Merluccius productus*
Black Rockfish	*Sebastes maliger*
Bocaccio	*Sebastes paucispinis*
Brown Rockfish	*Sebastes auriculatus*
Copper Rockfish	*Sebastes caurinus*
Quillback Rockfish	*Sebastes maliger*
English Sole	*Pleuronectes vetulus*
Pacific Sanddab	*Citharichthys sordidus*
Rex Sole	*Glyptocephalus zachirus*
Rock Sole	*Lepidopsetta bilineata*
Starry Flounder	*Platichthys stellatus*
Coastal Pelagic Species	
Pacific Sardine	*Sardinops sagax*
Pacific (Chub) Mackerel	*Scomber japonicus*
Northern Anchovy	*Engraulis mordax*
Jack Mackerel	*Trachurus symmetricus*
California Market Squid	*Loligo opalescens*
Pacific Salmon Species	
Chinook Salmon	*Oncorhyncus tshawytcha*
Coho Salmon	*Oncorhyncus kisutch*

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